

GUIDELINES FOR THE POTENTIAL IMPLEMENTATION OF THE

Technical Guidance on Comprehensive Risk Assessment
and Planning in the Context of Climate Change
(developed by UNDRR and GIZ, with the support of Eurac Research)

IN PLANNING INSTRUMENTS IN COLOMBIA

RESULTS REPORT



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Global Initiative on Disaster Risk Management
Jacqueline Begerow – *Project Leader, GIDRM*
Marie-Christin Rufert – *Advisor, GIDRM* Alejandra
Barragán - *Technical Advisor - GIDRM* Calle 125 #
19-24, oficina 702
Bogotá, Colombia
www.giz.de/kolumbien

E info@giz.de
I www.giz.de/en

Fondo Acción

Natalia Arango Vélez
Executive Director

Elizabeth Valenzuela Camacho
Technical Director

Germán Botero Ortiz
Administrative and Financial Director

Sofia Cuenca
Legal Director

Pablo Devis Posada
Climate Change Coordinator

Authors
Gustavo Adolfo Carrión Barrero – *Team Leader*
Alexandra Arévalo Espinosa
Claudia Jimena Cortés
David Fayad Sanz

Design/layout/illustrations
orotaller.com

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1 INTRODUCTION	5
------------------	---

2 CONTEXT	8
-------------	---

3 METHODOLOGY	13
-----------------	----

3.1. Reviewing the inclusion of the guidelines, phases and methods proposed by the Guidance in Colombian legislation and guides for planning instruments	14
3.2. Classifying territorial entities according to their DRM capacities and formulating recommendations	16
3.3. Designing and implementing the capacity building strategy for the potential implementation of the Guidance	17

4 SUMMARY OF THE CONTENT OF THE GUIDANCE APPLICABLE IN COLOMBIA	20
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5 OVERVIEW OF THE INCLUSION OF THE PROPOSED PRINCIPLES IN TERRITORIAL PLANNING INSTRUMENTS	28
--	----

6 RESULTS OF THE CLASSIFICATION OF TERRITORIAL ENTITIES BY CAPACITY AND THE CAPACITY BUILDING PROCESS	34
---	----

3.1. Classification of territorial entities according to their DRM capacities	35
3.2. Building technical capacity to use the Guidance	37

7 LESSONS LEARNED	42
---------------------	----


BIBLIOGRAPHY	46
--------------	----

ABBREVIATIONS

CCA	Climate change adaptation
CRA	Comprehensive risk assessment
DNP	National Planning Department
DRM	Disaster risk management
DRR	Disaster risk reduction
GIDRM	Global Initiative on Disaster Risk Management
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IDEAM	Institute of Hydrology, Meteorology and Environmental Studies
IPACC	Adapting Public Investment to Climate Change in Latin America
ISO	International Organization for Standardization
MinAmbiente	Ministry of Environment and Sustainable Development
NBS	Nature-based solution
NC3	Third National Communication on Climate Change
PDGRD	Department disaster risk management plan
PIGCCS	Comprehensive sectoral climate change management plan
PIGCCT	Comprehensive territorial climate change management plan
PMGRD	Municipal disaster risk management plan
SDGs	Sustainable Development Goals
SINA	National Environmental System
SINOT	National Land Use System
SISCLIMA	National Climate Change System
SNGRD	National Disaster Risk Management System
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNGRD	National Unit for Disaster Risk Management

1 |

INTRODUCTION



In the context of the increasing challenges posed by disaster risks, in 2013 the German Federal Ministry for Economic Cooperation and Development (BMZ) created the Global Initiative on Disaster Risk Management (GIDRM), which is now in its third phase of implementation. It is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The objective of the GIDRM is to strengthen the German contribution to improving disaster risk management (DRM) worldwide and implementing the Sendai Framework for Disaster Risk Reduction 2015-2030.

The initiative acknowledges that development processes occur in a setting characterised by uncertainty and complexity, with dynamic risks and emerging threats at the local and global levels. In this context, each development decision has the potential to promote resilience and sustainability but also to add to the creation of new risks or intensify existing ones. In view of this, the GIDRM adopts a multi-hazard and compound-event approach, which addresses natural, socio-natural, and unintentional anthropic phenomena and analyses them under climate change conditions.

The lack of capacity to understand and manage the systemic features of risks threatens the attainment of the objectives set out in the Sendai Framework 2015-2030 and the 2030 Agenda for Sustainable Development because disasters affect the achievement of long-term development and hinder countries' efforts to unlock development opportunities.

In this context, Phase III of the GIDRM (2020-2023) aims to strengthen development by ensuring a better understanding of risk and risk governance, while Phases I (2013-2018) and II (2018-2020) focused on promoting networks for development, strengthening DRM approaches, and increasing coherence between global agendas (Sendai Framework 2015-2030, 2030 Agenda, New Urban Agenda and Paris Agreement).

As part of Phase III of the GIDRM, an analysis was carried out on the potential implementation in Colombia of *Technical Guidance on Comprehensive Risk Assessment and Planning in the Context of Climate Change*¹ (hereinafter the Guidance), with a focus on planning instruments. The analysis involved a review of the country's specific institutional, technical, legislative, and regulatory context, carried out by Fondo Acción on behalf of GIZ in 2022.

¹ | Document available at:
<https://www.undrr.org/publication/technical-guidance-comprehensive-risk-assessment-and-planning-context-climate-change>

This report sets out the main findings of the analysis, which served as a basis for drawing up recommendations and a roadmap for the potential implementation of the Guidance in Colombia. It is divided into seven chapters, including the introduction. The second chapter explains the context in which the feasibility analysis for the potential implementation of the Guidance in Colombia was conducted. The third chapter describes information sources and methodologies employed, and the fourth presents a summary of the guidelines, principles, phases, and methods proposed in the Guidance and applicable to risk management in the context of climate change. Chapters 5 to 7 set out the findings. Chapter 5 provides an overview of the inclusion of the principles of the Guidance in legislation and guides on the formulation of planning instruments. Chapter 6 presents the results from the classification of territorial entities (departments, municipalities, districts, and indigenous territories), according to their DRM capacities, and the capacity building strategy developed under the consultancy. Lastly, Chapter 7 summarises the main lessons learned from the process.



2 |

CONTEXT



The **Technical Guidance on Comprehensive Risk Assessment and Planning in the Context of Climate Change** provides guidelines on how risks can be comprehensively and systemically addressed. Furthermore, it proposes elements for the integration of disaster risk reduction (DRR) agendas, especially the **Sendai Framework 2015-2030**, and **climate change adaptation (CCA)** agendas, while also contributing to the achievement of other development agendas, such as the **Sustainable Development Goals (SDGs)**.

The content of the Guidance is consistent with the GIZ GIDRM conceptual frameworks for risk-informed development and with the Global Assessment Report on Disaster Risk Reduction 2019, published by the United Nations Office for Disaster Risk Reduction (UNDRR). In addition, it includes elements from the Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC), especially the Fifth Assessment Report. It recognises that the application of the Guidance must be adjusted to the context and realities of each country.

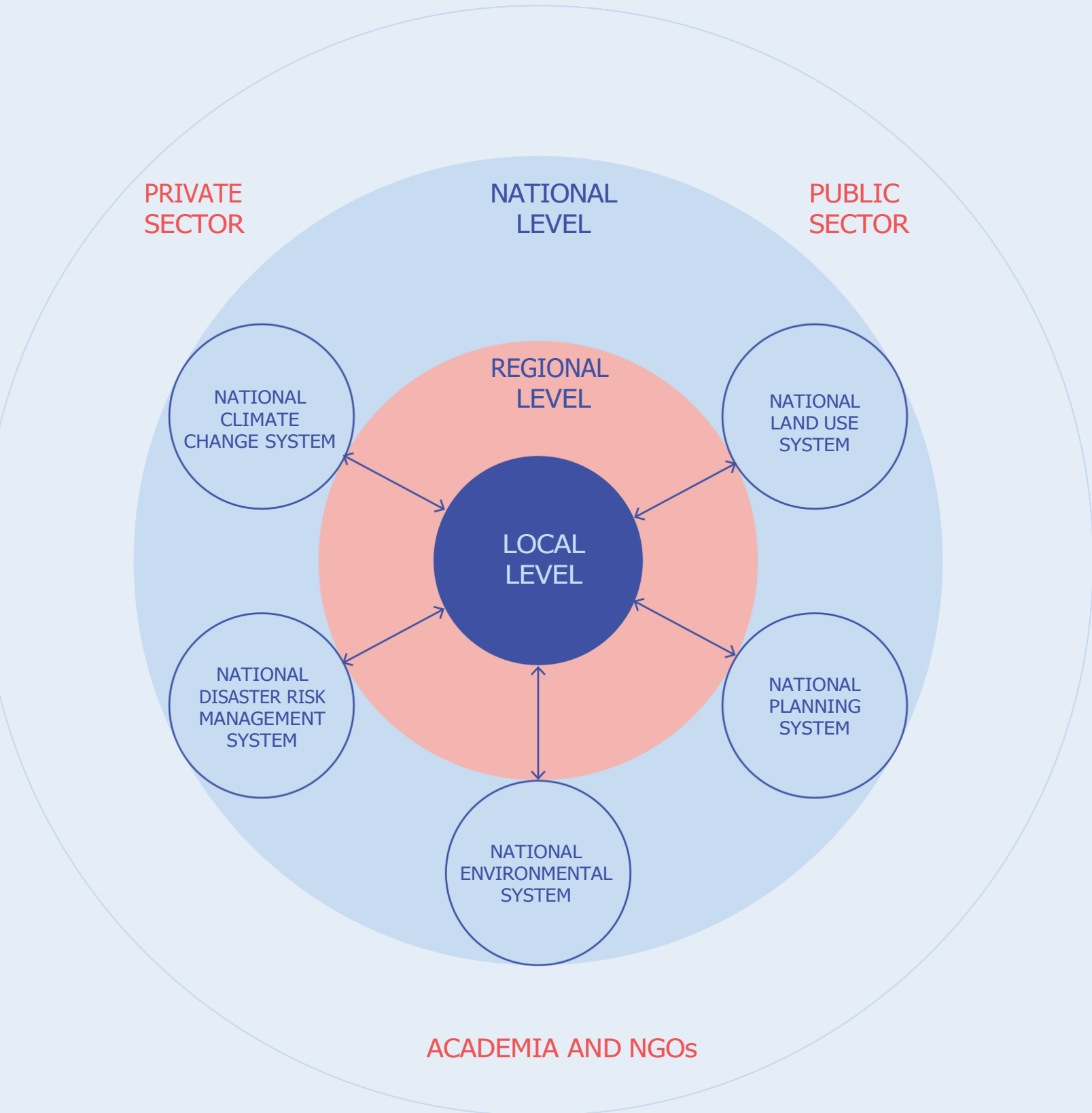
A pilot exercise was conducted in Colombia with the aim of analysing the feasibility of implementing the Guidance in its main territorial planning instruments related to DRM and CCA – comprehensive territorial climate change management plans (PIGCCTs), comprehensive sectoral climate change management plans (PIGCCSs), municipal DRM plans (PMGRDs), department DRM plans (PDGRDs), development plans and land use plans – and in infrastructure investment projects. Priority was given to these instruments because they are fundamental for DRM and CCA planning, land use planning and development and therefore have the potential to contribute to reducing hazards and vulnerability and boosting development without generating new risks.

These instruments are part of the national-territorial coordination systems that are intended to operate in a harmonised manner. They have complementary roles aimed at ensuring proper land use, the effective use of natural and financial resources and the wellbeing and safety of the population (Figure 1).



Figure 1. Interrelationship of national-territorial coordination systems

Source: Developed by the author





There are three reasons why it is important for the analysis to focus on territorial instruments relating to comprehensive risk assessment (CRA) in the context of climate change:

- While processes to develop, finance and monitor National Adaptation Plans, Nationally Determined Contributions and strategies to achieve the SDGs are most often driven by governments at the national level, the implementation stage generally involves subnational actors. It is therefore at the local level where the bulk of implementation will take place (Dazé, Price-Kelly and Rass (2016), cited in NAP Global Network, 2018).

- The relationship between DRM and climate change management is more evident at the subnational level, taking into account current and future impacts of climate change and variability. It is therefore at this level that there is the greatest need for CRA capacities to be enhanced and strengthened, as this is where the impacts are felt.

- DRM and CCA efforts are undertaken locally, are linked to development measures and are the result of the intervention of social and institutional actors either as creators of risk or as stakeholders that could potentially be affected by the manifestation of risks. Therefore, in practice, environmental management, DRM, development management, and land use and development planning at the territorial level share management elements.



The instruments analysed are described in the table below.

Table 1. Description of planning systems analysed for the implementation of the Guidance

COORDINATION SYSTEM	PLANNING INSTRUMENT	SCOPE OF APPLICATION	
		MUNICIPAL	DEPARTMENT
National Climate Change System (SISCLIMA)	Comprehensive territorial climate change management plans (PIGCCTs) Instruments by means of which territorial entities and regional environmental authorities identify, assess, prioritise and define measures and actions related to adaptation and the mitigation of greenhouse gas emissions to be implemented in the territory concerned (Law 1931 of 2018).		●
	Comprehensive sectoral climate change management plans (PIGCCSs) Instruments by means of which each Ministry identifies, assesses and guides the incorporation of greenhouse gas mitigation and CCA measures into the policies and regulations of the sector concerned (Law 1931 of 2018).		SECTORAL
National Disaster Risk Management System (SNGRD)	Municipal DRM plans (PMGRDs) and department DRM plans (PDGRDs) Main risk management planning instruments by means of which territorial DRM councils identify, characterise, and prioritise risk scenarios in their municipalities or departments. The purpose of these plans is to establish, programme and monitor the actions to be implemented by entities, institutions, and organisations in relation to risk information, risk reduction and disaster management processes.	●	
			●
National Land Use System (SINOT)	Municipal land use plans Basic instrument for the municipal land use planning process. It can be defined as the set of objectives, guidelines, policies, strategies, goals, programmes, actions, and standards adopted to guide and manage the physical development of the territory and land use (Law 388 of 1997).	●	
National Planning System	Municipal and department development plans Short-term planning instruments that guide the actions of department, municipal and district authorities, and their use of economic resources for each four-year government term, based on the government programme and the land use plan.	●	●
	Public investment projects Operating units for development planning that allocate public resources to resolve problems or meet needs for the wellbeing of the population. They encompass time-bound activities that use these resources wholly or partially in order to create, expand, improve or restore the capacity to produce or supply goods and services (DNP, n.d.).	●	●

3 |

METHODOLOGY

This chapter describes the activities carried out to analyse the feasibility of implementing the Guidance in territorial planning instruments, by examining the guidelines, phases and methods it proposes and determining whether they are included in the existing legislation and methodology guides for planning instruments in Colombia. It also identifies strengths and challenges for the implementation of these guidelines, phases and methods.

3.1 | REVIEWING THE INCLUSION OF THE GUIDELINES, PHASES AND METHODS PROPOSED BY THE GUIDANCE IN COLOMBIAN LEGISLATION AND GUIDES FOR PLANNING INSTRUMENTS

The first step involved a detailed review of every chapter of the Guidance to identify and select applicable guidelines, phases and methods, with a view to determining whether they are useful and relevant for CRA in the context of climate change in Colombia.

Planning instruments were then examined to analyse strengths and challenges for the implementation of the Guidance. Taking into account the links between development, CCA and DRM agendas, the following planning instruments were selected for analysis: land use plans, territorial DRM plans, territorial development plans, PIGCCTs, PIGCCSs and infrastructure investment projects, developed under the SISCLIMA, the SNGRD and the National Planning System.

The laws and decrees that constitute the legal framework for developing the instruments selected were reviewed. A number of methodological guides were prioritised, particularly those prepared most recently by national actors and including those that establish specific guidelines on the incorporation of climate change or risk management elements. The following table shows the legislation and guides examined.



Table 2. Legislation and guides examined

INSTRUMENTS	LEGISLATION	TECHNICAL GUIDES
Development plans	Law 152 of 1994	Guide for the inclusion of DRM in territorial development plans 2020-2023 (UNGRD, 2020)
Land use plans	Law 388 of 1997 Decree 1077 of 2015 (land use instruments – includes Decree 1807 of 2014)	Integration of DRM and municipal land use planning (UNGRD, 2015) Climate change considerations for land use planning (MinAmbiente, 2018)
Territorial DRM plans	Law 1523 of 2012	Guide for the formulation of PMGRDs (UNGRD, 2012) Guide for the integration of climate variability and DRM at the territorial level (UNGRD, 2018)
Comprehensive territorial climate change management plans	Law 1931 of 2018	Guide for the formulation and implementation of PIGCCTs (MinAmbiente – unpublished draft)
Comprehensive sectoral climate change management plans	Law 1931 of 2018	Guide for the formulation, implementation, monitoring, evaluation and updating of PIGCCSs (DNP – unpublished draft)
Infrastructure investment projects	Law 1523 of 2012 (Art. 38) Agreement 52 of the General System of Royalties	Toolbox for resilient investments developed as an output of the project Adapting Public Investment to Climate Change in Latin America (IPACC) II (DNP, MinAmbiente, UNGRD, Ministry of Finance, GIZ, n.d.)

The next step consisted in checking whether the guidelines, phases and methods proposed in the Guidance were incorporated into existing legislation and guides in Colombia. This was done by examining each piece of legislation and guide to evaluate whether each of the guidelines and phases was included in them. This assessment was then used to identify strengths in terms of progress in including the Guidance proposals and detect technical, methodological, institutional, regulatory and financial challenges relating to those that had not been included.

The inclusion of methods was analysed differently because the types of methods recommended and used serve the specific purpose of risk assessment, so that not all the methods proposed in the Guidance would necessarily have to be included in all the guides and legislation that contain indications for planning instruments.

Therefore, it was verified whether each guide or piece of legislation recommends the use of quantitative, semi-quantitative or qualitative methods and whether, in the use of these methods, they propose employing the following tools or concepts: (i) analysis of compound events (multi-hazard), (ii) impact chains (to assess cascading impacts), (iii) use of various types of methods (hybrid approach) and (iv) spatial representation of hazards, exposure and vulnerability and their inclusion in risk mapping.

3.2 | CLASSIFYING TERRITORIAL ENTITIES ACCORDING TO THEIR DRM CAPACITIES AND FORMULATING RECOMMENDATIONS

Two recent documents on risk assessment in territorial entities were examined: the capacity-adjusted risk index, developed by the National Planning Department (DNP, 2019), and the Risk Atlas, developed by the National Unit for Disaster Risk Management (UNGRD, 2018). Colombia's Third National Communication on Climate Change (NC3), which includes an adaptive capacity assessment (IDEAM et al., 2017), was also examined.

The documents reviewed show different and sometimes seemingly contradictory results, which can be explained by the fact that each one has different methodologies and aims and assesses different hazards.

Recommendations were then drawn up for implementation, including general recommendations aimed at national and territorial entities and specific recommendations for territorial entities by level of DRM capacity. They were included in the roadmap developed as a supplement to this report.

3.3 | DESIGNING AND IMPLEMENTING THE CAPACITY BUILDING STRATEGY FOR THE POTENTIAL IMPLEMENTATION OF THE GUIDANCE

As an initial step in prioritising potential users of the Guidance, a list was drawn up of actors that are part of the national-territorial coordination systems and have roles in DRM, CCA and development planning, particularly in developing and implementing prioritised territorial planning instruments: SISCLIMA, SNGRD, the National Environmental System (SINA), SINOT and the National Planning System. Three central government institutions were also included, namely DNP, UNGRD and the Ministry of Environment and Sustainable Development (MinAmbiente), as they are responsible for developing legislation and guidelines for instruments and coordinating the systems.

Two types of actors were considered in each of the systems: (i) authorities and (ii) coordination bodies and mechanisms. With a view to classifying them as key, primary or secondary actors, the following analysis criteria were applied to all actors to define their participation in the capacity building strategy.

A |

Actor category

Actors are categorised as public, private, public-private or community stakeholders.

Priority is given to public stakeholders because, in principle, they require greater capacity building for the formulation of territorial planning instruments.

B |

Territorial scale

Refers to whether the actor has nationwide, regional or local influence, according to the country's administrative levels. Subnational (regional and local) actors are prioritised.

C |

Role in territorial planning instruments

For each of the prioritized territorial planning instruments, the role of each actor in the logical planning framework is established (formulation, approval, implementation, monitoring and participation).

Finally, the actors were scored according to these criteria and assigned to a category: key, primary or secondary. Key and primary actors are those with a greater involvement in terms of planning and risk management at the territorial level, differentiated according to their roles.

Based on this stakeholder mapping, it was proposed that the capacity building strategy be implemented through two virtual and three in-person workshops to facilitate the active participation of professionals from municipalities and departments that are exposed to different types of climate hazards, due to their geographic features, namely the Andean area, the coastal area, border areas and the Amazon foothills.

The venues for the regional workshops were selected taking into account two factors.

A

Colombia's territorial dynamics are complex, with cities and regions having different capacities and distinct risk scenarios.

B

Technical capacity building must be based on risk governance approaches, with work sessions involving the main users of the Guidance.

Colombia's location in the Intertropical Convergence Zone means that it has intense rainy seasons and dry spells each year, exacerbated by the El Niño and La Niña phenomena. These characteristics make Colombia a territory that is very prone to natural hazards (UNGRD, 2018).

In the Andean area, there is a group of cities and urban agglomerations that are considered leaders in territorial climate change and disaster risk management (Bogotá, Medellín and Manizales) and have greater technical and financial capacities. They have risk scenarios typical of cities located in Inter-Andean valleys, which means they are prone to hazards such as landslides, floods and lack of rain. These cities have robust institutional schemes and arrangements to handle risk management in the context of climate change, which are worth studying and comparing to identify successful experiences in managing complex risks.

A second workshop was proposed for the urban agglomeration of Cúcuta, a city on the border with Venezuela. This venue was chosen because, in addition to complex physical conditions and high vulnerability to disasters caused by extreme weather events, it also provides an opportunity to address the analysis of systemic risks associated with migration from Venezuela.

The third set of workshops was planned in Barranquilla to which actors from nearby coastal departments would be invited. There was also the possibility of inviting actors from the island of San Andrés, the Colombian territory with the highest level of climate risk. In addition to the consolidation of built-up areas along the coast, there are also climate risk scenarios typical of coastal areas, with increased exposure to events such as tropical cyclones, hurricanes, storm surges, coastline changes and coastal floods and other threats resulting from biodiversity loss and sea-level rise.

Finally, for the Amazon foothills area, a workshop was proposed in Florencia. As it has a high level of risk and vulnerability associated with floods, rapid river rises and flash floods, is a single-core city and department capital and has greater technical and financial needs than other areas of the country, it provides a good opportunity to consider the feasibility of applying the Guidance in low-population municipalities and areas.



4 |

SUMMARY OF THE CONTENT OF THE GUIDANCE APPLICABLE IN COLOMBIA

The comprehensive risk perspective is proposed in the Guidance through 10 principles which address methodology, vision and objectives, with a view to assessing risks and deciding measures to reduce them. These principles are key to managing a CRA approach and incorporating it into planning in the context of climate change. The Guidance describes the application of these principles and the concepts they involve according to the phases proposed for risk assessment and the use of the results in territorial planning. The principles are described below.

Description of the key principles of the Guidance

1 |

Putting risk to human and ecological systems at the centre by considering:

- The dynamic interaction among hazards, vulnerability, exposure and underlying risk drivers when assessing risk and seeking solutions
- CRA as a foundation and integral part of the overall risk management process
- The added value of bringing DRR and CCA communities of practice closer together

2 |

Fully accounting for the context of climate change by considering:

- Climate change as an underlying risk driver that modifies climate-related hazards and also vulnerability and exposure now and in the future
- The full spectrum of climate-related hazards (extreme events, slow-onset processes and trends) as well as their interaction with non-climatic hazards
- Current and future climate risk relevant for the sectors and systems analysed, decision-making and planning

3 |

Recognising the complex and systemic nature of risks by considering:

- Compound events, cascading hazards, impacts and risks
- How these cascades could be interrupted
- Risks to interrelated human and ecological subsystems
- Application of hybrid methods for CRA: quantitative, qualitative and participatory

4 |

Applying inclusive risk governance by:

- Partnering with multiple stakeholders for a whole-of-government and whole-of-society approach
- Strengthening the involvement of decision-makers and populations at risk in order to increase buy-in and facilitate implementation
- Keeping the end users in mind throughout CRA and tailoring risk information to different audiences

5 |

Strengthening risk communication, information and knowledge sources by considering:

- A combination of diverse information sources, methods and knowledge to include scientific, traditional, local and indigenous knowledge, facilitating co-creation processes and designing measures
- Strengthening climate information and services

6 |

Using multidisciplinary approaches to identify and select measures by considering:

- A broad portfolio and combination of risk management and CCA measures, engaging various sectors, to address multiple and context-specific risks
- Diverse information and knowledge sources by including at-risk population

7 |

Using the concept of risk tolerance to:

- Assess risks according to their tolerability to spur action
- Inform the identification and selection of appropriate risk reduction and risk management measures

8 |

Addressing risks through nature-based solutions (NbSs) by considering:

- The role of ecosystems and their services as part of the risk (climate impacts on ecosystems and their services cause risks for human systems, and the degradation of ecosystem services increases vulnerability to climate risks)
- The approach to be adaptable to different spatial scales, including transboundary scales, where required

9 |

Integrating risk across sectors and levels by considering:

- Synergies and trade-offs across multiple levels, linking local realities with national and international processes
- The influence on areas with the potential to multiply effects, such as public financial systems and the education sector

10 |

Using iterative and flexible processes by considering:

- Iterative and dynamic monitoring, assessment and learning frameworks that allow for adjustments to planning and execution
- The added value of the overall CRA process as a way to fill information gaps and improve information sharing and coordination mechanisms

Chapter 3 of the Guidance proposes an iterative process for the assessment of hazards, exposure, vulnerability and risks, carried out in four main phases, describing the steps involved and providing methodological recommendations. The phases and steps, which are based on the ISO 31000 risk management standard, are shown in the table below, and the interrelationships between them are shown in Figure 2.

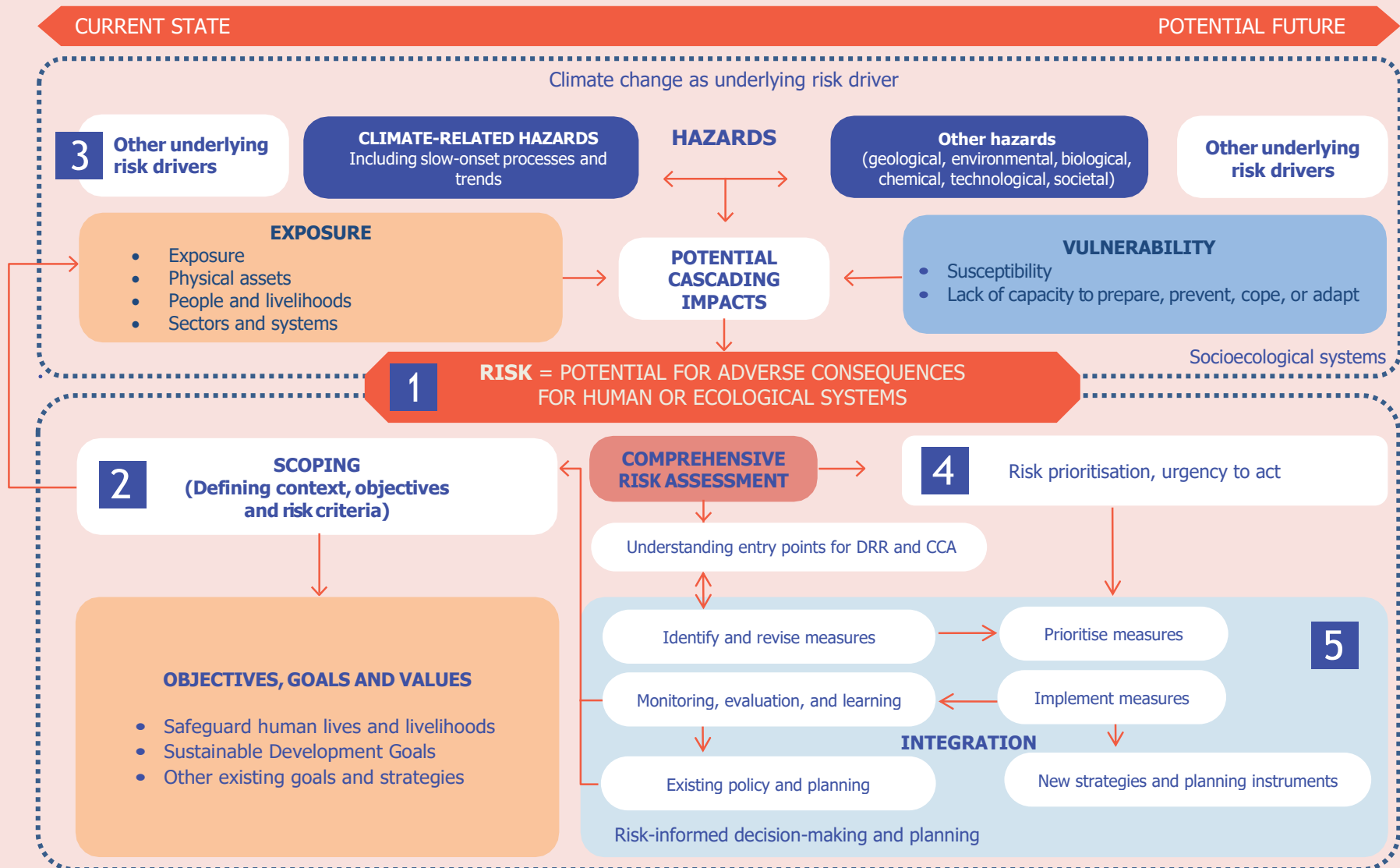
Table 3. Steps in the comprehensive risk assessment process

Source: Developed by the author

PHASE	STEP
1 Scoping	<ol style="list-style-type: none"> 1.1. Defining context 1.2. Defining objectives 1.3. Defining scope and method set-up 1.4. Designing governance and participation mechanisms 1.5. Defining risk criteria
2 Risk identification	Selecting hazards, impacts and risks to be considered in the risk analysis phase
3 Risk analysis	<ol style="list-style-type: none"> 3.1. Considering underlying risk factors (including climate change) 3.2. Exposure 3.3. Vulnerability 3.4. Potential cascading impacts 3.5. Adverse consequences for human and ecological systems
4 Risk evaluation	<ol style="list-style-type: none"> 4.1. Prioritising risks 4.2. Identifying and prioritising measures
5 Integration of risk assessment into decision-making and planning processes	<ol style="list-style-type: none"> 5.1. Implementing measures 5.2. Creating new strategies and planning instruments 5.3. Modifying existing policy and planning framework

Figure 2. Comprehensive risk assessment process and use in planning

Source: Adapted from UNDRR and GIZ, 2021



The Guidance also proposes the use of methods and tools for CRA purposes. The following table shows different types of methods with examples and the corresponding methodological tools.

Types of methods

Quantitative	Semi-quantitative	Qualitative
1) Stochastic (return periods, vulnerability curves)	Indicators (based on data and expert judgement)	Narratives (based on experts and stakeholders)
2) Deterministic – physical (stress tests, impact models)		

CRA tools

Analysis of compound events (multi-hazard)	Impact chains (to assess cascading impacts)	Use of various types of methods (hybrid approach)	Spatial representation of hazards, exposure, vulnerability and risk and inclusion in risk mapping
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The Guidance highlights differences in DRM and CCA perspectives (Table 5) and recognises that even when steps have been taken, in accordance with policy agendas, to integrate disaster risk and climate risk assessment, there is still a risk of disjointed actions in analysis and implementation processes.

Table 5. Differences in DRM and CCA perspectives

Source: Developed by the author

ASPECT	DISASTER RISK MANAGEMENT	CLIMATE CHANGE ADAPTATION
Main focus	Consequences of specific events for people and physical assets and the economic losses they cause	Potential impacts of climate change on various human systems and ecological systems These adverse consequences or impacts are usually long-term deteriorations of a system triggered by long-term trends in extreme weather events as well as slow-onset processes (e.g. sea-level rise and salinisation).
Key questions	What are the potential consequences of specific events and how likely are they?	What would happen if...? Addressing the potential adverse consequences of climate change for different potential future states (e.g. one specific year in the future and different emission and global warming scenarios)
Representation of risk	Mainly addresses the current situation based on past observation and probabilistic approaches, assuming stationarity in time for separate hazards Systems tend to be designed to face relatively rare but severe events, assuming that such systems can also cope with less severe events occurring more frequently.	Includes current climate risks, but the main objective is to address future changes. As climate scenarios per se have no likelihood, no actual likelihood can be assigned to the description of consequences. Risks are commonly described as a range of adverse consequences for different human and ecological systems, caused by a complex interaction of direct and indirect cascading impacts and dynamics of exposure, vulnerability and underlying risk drivers.
Vulnerability analysis	Physical vulnerability and some aspects of social vulnerability are analysed for individuals and their livelihoods and recovery capacity.	Consequences are caused by a complex interaction of direct and indirect cascading impacts and dynamics of exposure, vulnerability and underlying risk drivers.
Management objectives	Focuses on preparedness, prevention and risk transfer and on coping and recovery strategies and measures	The focus of risk reduction is anticipatory adaptation to the potential new situation.

5 |

OVERVIEW OF THE INCLUSION OF THE PROPOSED PRINCIPLES IN TERRITORIAL PLANNING INSTRUMENTS

The review of legislation and guides on developing planning instruments revealed that some of the principles set out in the Guidance for CRA are reflected in the content of laws governing DRM, climate change management and land use planning, namely Law 1523 of 2012, Law 1931 of 2018 and Law 388 of 1997 (at least partially), while others are not included. Law 152 of 1994 concerning the preparation of development plans does not include any of the principles, as it covers development issues as a whole and does not address specific environmental issues. In general, fewer principles were included in the guides examined. The list of laws and guides reviewed is shown in Table 2, and an overview of the inclusion of the principles in these documents is provided in Table 6.

Table 6. Overview of the inclusion of the proposed principles in the legislation and guides reviewed

PRINCIPLE	INCLUSION IN LEGISLATION AND INSTRUMENTS
<p>1 Putting risk to human and ecological systems at the centre of CRA</p>	<p>The laws governing the SNGRD and the SISCLIMA consider that DRM and CCA include measures and protection for ecosystems and human systems; they can therefore be included in implementing regulations.</p> <p>Law 1523 of 2012 includes ecosystem services in the exposed elements it refers to, and the object of Law 1931 of 2018 includes reducing the vulnerability of the population and ecosystems to the effects of climate change.</p> <p>The PIGCCT guide considers human and ecological systems in the comprehensive characterisation of the territory for assessment of climate-territory dynamics and the effects of climate change, while the PIGCCS guide includes ecosystem services as elements that sectors depend on and that must be evaluated to assess their exposure and vulnerability to hazards.</p> <p>Land use plans include spatial planning perspectives and therefore address issues relating to human and ecological systems in each territorial structure. On the other hand, the other guides propose assessment and measures for human systems, but not for ecosystems.</p>
<p>2 Fully accounting for the context of climate change</p>	<p>The context of climate change is the central focus of Law 1931 of 2018, the PIGCCT and PIGCCS guides and the climate change guide for land use planning, prepared by MinAmbiente, as the purpose of these instruments is to address climate change. While Law 1523 of 2012 mentions adaptation as part of DRM, the legislation concerning land use planning (Law 388 of 1997 and Decree 1807 of 2014) does not explicitly refer to climate change as a factor driving changes in the current or future state of hazards, vulnerability and risk.</p> <p>The other guides mention assessment in the context of climate change, but recommend the use of the NC3 scenarios, without proposing methodological approaches to assess climate risks, which are usually described in terms of their impact on the systems assessed.</p>
<p>3 Recognising the complex and systemic nature of risks</p>	<p>This is one of the principles least addressed in the legislation and guides on the instruments reviewed, largely because they propose assessing hazards individually. Furthermore, hazards and vulnerability are assessed using historic data, without considering future changes. Systemic characteristics are not taken into account in actions or assessments considering various sectors or multiple aspects of development.</p> <p>Although Law 388 of 1997 does not explicitly address the systemic aspects of risk, it does stipulate that land use planning must provide for restrictions on land use in areas identified in the SINA's planning instruments as containing important ecosystems and in areas where risks cannot be mitigated, which must be designated as protected land.</p>

Table 6. Overview of the inclusion of the proposed principles in the legislation and guides reviewed

PRINCIPLE	INCLUSION IN LEGISLATION AND INSTRUMENTS
4 Applying inclusive risk governance	Law 1523 of 2012 and Law 1931 of 2018 provide for DRM and climate change management, while Law 388 of 1997 does not. In the guides on climate change management, development plans, climate variability in DRM and projects, participatory mechanisms are recommended, but not established as a main step in assessing risks or selecting measures.
5 Strengthening risk communication, information and knowledge sources	Law 1931 of 2018 and the PIGCCS and PIGCCT guides propose employing different types of information sources in a complementary fashion, including traditional and community knowledge, and ensuring effective communication in processes for assessing risks and selecting measures. In the guides for development plans and projects, the use of supplementary sources is proposed, although this mainly refers to technical documents. The other guides do not explicitly address this matter.
6 Using multidisciplinary approaches to identify and select measures	This is the principle least included in the legislation and guides reviewed. It could, however, be applied under the current legal framework if there is an approach based on more comprehensive assessments and measures that takes into account human and ecological systems.
7 Using the concept of risk tolerance	<p>The concept of risk tolerance can be likened to the concept of acceptable risk that UNGRD has been developing for some years: 'The potential social and economic consequences that a society or segment of society consciously decides to accept or tolerate, whether implicitly or explicitly, considering action to reduce the risk unnecessary, untimely or impossible, given the existing economic, social, political, cultural and technical context.' (UNGRD, 2017)</p> <p>The IPACC guides mention tolerance as one of the criteria to be applied in risk assessment, although it does not explain how this should be done. It is not mentioned in the other guides.</p>

Table 6. Overview of the inclusion of the proposed principles in the legislation and guides reviewed

PRINCIPLE	INCLUSION IN LEGISLATION AND INSTRUMENTS
<p>8 Addressing, minimising and averting risks through NbSs</p>	<p>Law 1931 of 2018, Law 1523 of 2012 and the climate change management guides explicitly recommend using NbSs and protecting ecosystems to manage risks. The climate change guide for land use plans and the IPACC guides include related but indirect recommendations. There are no such recommendations in the other guides reviewed.</p>
<p>9 Integrating risk across sectors and levels</p>	<p>This is promoted in some of the laws and guides reviewed. Law 1523 of 2012 and Law 1931 of 2018 provide that risk should be assessed and measures implemented across all territorial levels and sectors and recommend coordinating measures with those proposed in other planning instruments, including land use plans. However, there is no mention of intersectoral assessments or measures. As the guides address this principle indirectly, it could be applied under the existing legal and methodological framework, with emphasis on the instruments that include intersectoral aspects, such as land use plans and development plans.</p>
<p>10 Using iterative and flexible processes</p>	<p>In Law 1931 of 2018 and the PIGCCS and PIGCCT guides, it is proposed that these plans be reviewed and adjusted according to information provided by the Climate Change Information System. In the other laws and guides, the topic is either mentioned indirectly or not at all</p>

Summary

Law 1931 of 2018 and the climate change management guides incorporate a larger number of the principles proposed in the Guidance. Their content therefore facilitates its full implementation. All the principles that are not incorporated relate to methodological aspects and can therefore be included in future updates of the guides or through the selection of particular assessment methods by the teams responsible for formulating the plans. These principles are (a) recognising the complex and systemic nature of risks, (b) using multidisciplinary approaches to identify and select measures and (c) using the concept of risk tolerance.

Law 1523 of 2012 allows for all the principles to be wholly or partially developed and included. This is an advantage as it means that they can be developed in the law's implementing regulations. In the PMGRD and PDGRD guides, the principles are either partially addressed or not at all. Therefore, the challenge here is to develop methodological proposals to incorporate the principles, ensuring consistency with the provisions of the law.

The territorial and spatial vision of land use plans set out in Law 388 of 1997 seeks to integrate different dimensions and systems, such as ecological and human systems. Land use planning, as established in these plans, is aimed at protecting people and the main ecological structures. Therefore, this law includes the principle of putting risk to human and ecological systems at the centre. The other principles are not explicitly included. In implementing regulations on risk management (Decree 1807 of 2014, included in Decree 1077 of 2015), the main priority and focus is risk scenarios for major disasters and events that affect people (mainly floods, landslides and flash floods), and risk assessment based on ecosystem-related criteria is not addressed.

The MinAmbiente guide on land use planning emphasises ecosystem risks and vulnerabilities and recognises the complexity of disaster risks, but it does not propose methodological approaches, while the UNGRD guide emphasises the impact of disasters on people but not on ecosystems. The principles that are not included in either of the two guides on land use planning are (a) applying inclusive risk governance, (b) strengthening risk communication, information and knowledge sources, (c) using multidisciplinary approaches to identify and select measures and (d) using the concept of risk tolerance. The first three could be applied under existing legislation and guides, as they could be implemented through decisions made by the formulating teams. The latter principle would require updated guides with new methodological proposals.



The guide on incorporating DRM into development plans explicitly recommends addressing, minimising and averting risks through NbSs. The other principles are included partially or not at all. Climate change is mentioned in the policy framework and concepts and is considered as a factor that may alter hazard conditions, but there are no methodological recommendations for assessment. The systemic nature of risks is not addressed, although development plans have the potential to propose measures across sectors and territorial levels.



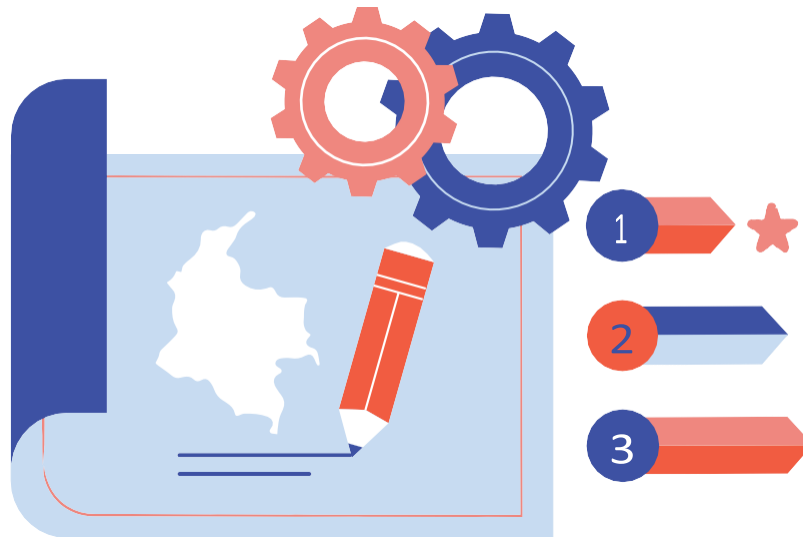
The IPACC guides on incorporating DRM into project formulation and implementation focus on the assessment of risks to human systems, society and infrastructure but only partially address risks to ecosystems. They do, however, propose the assessment of new hazard conditions in the environment resulting from projects including construction works. They also consider climate change as a factor that alters current risk conditions but do not sufficiently develop methods for assessment during project formulation.



6 |

RESULTS OF THE CLASSIFICATION OF TERRITORIAL ENTITIES BY CAPACITY AND THE CAPACITY BUILDING PROCESS

6.1 | CLASSIFICATION OF TERRITORIAL ENTITIES ACCORDING TO THEIR DRM CAPACITIES

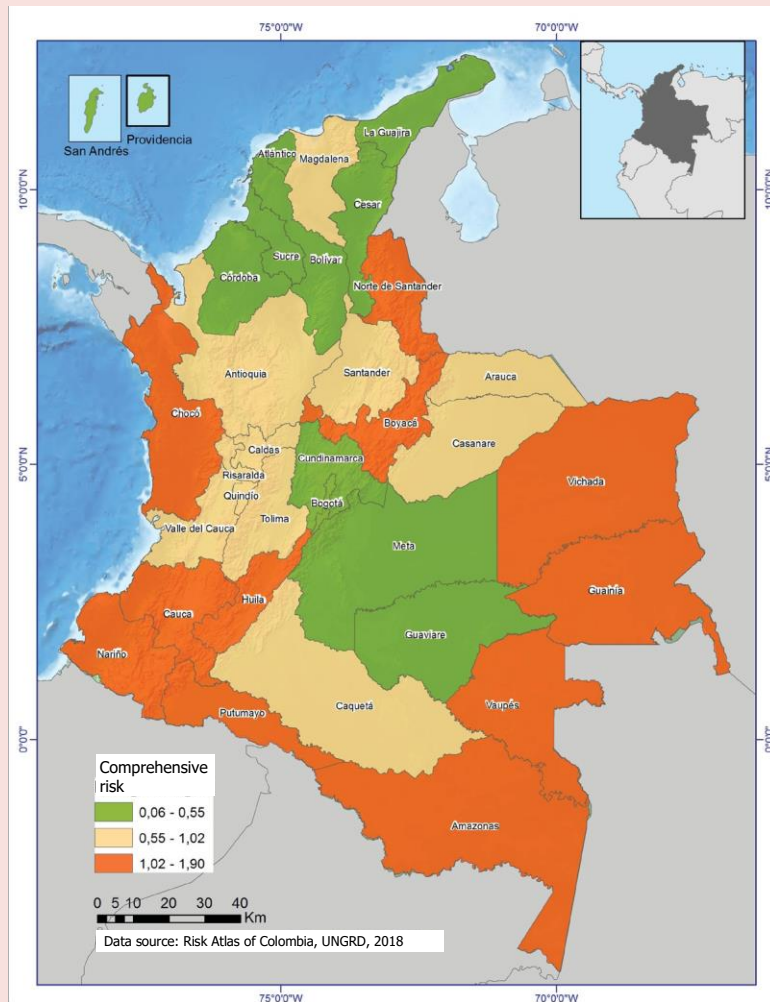


The classification of municipalities according to their DRM capacities is based on the results from the capacity-adjusted risk index (DNP, 2019), and the classification of departments on the results of the comprehensive risk index developed for the Risk Atlas of Colombia (UNGRD, 2018), as this document is the only one that assesses risks at the department level.

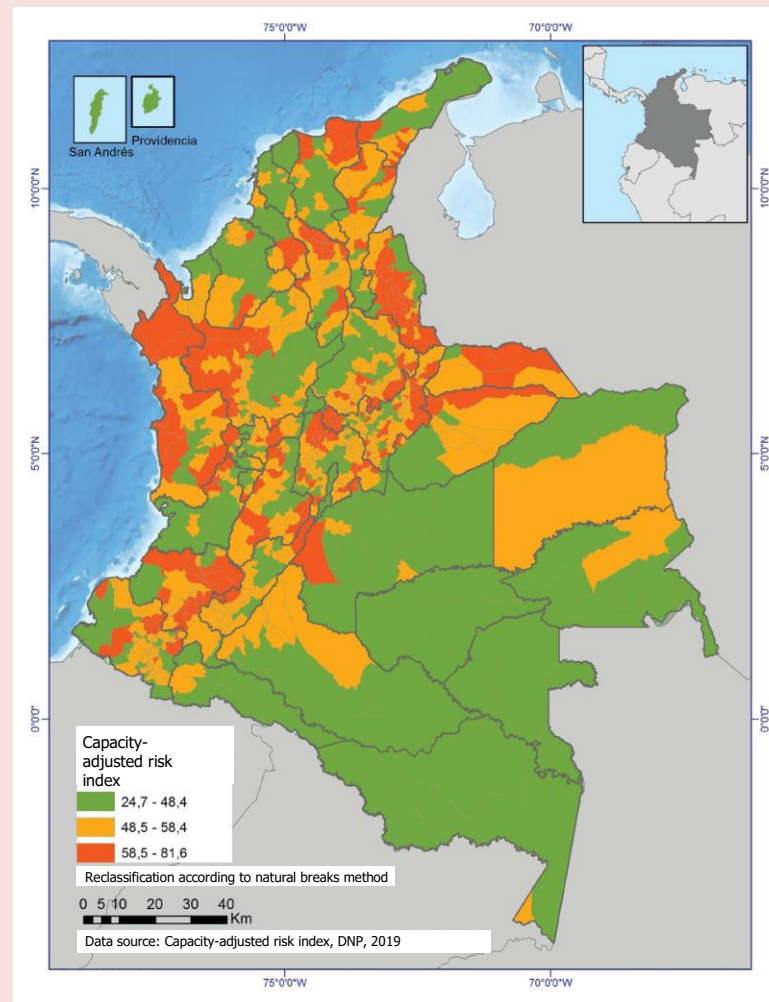
Both documents show widely dispersed results for risk values in the different areas. This can happen because the capacity-adjusted index and the potential damage values used for the Atlas are calculated taking into account a wide range of aspects, including administrative and social factors, vulnerability and hazards in the area, which vary for each territorial entity.

In this exercise, the municipalities were classified based on the results of the capacity-adjusted risk index developed by DNP, using the Jenks natural breaks method, which minimises differences within groups and maximises differences among groups. On the other hand, departments were reclassified into three groups, using the comprehensive risk index of the Risk Atlas. In this case, the quantile classification method was employed, which is best suited to evenly distributed data. The results of this classification according to level of capacity – high, medium or low – are shown on the maps below.

Figure 3. Classification map of municipalities according to the capacity-adjusted risk index and classification map of departments according to the comprehensive risk index of the Risk Atlas of Colombia



Source: Developed by the author, based on data from UNGRD, 2018



Source: Developed by the author, based on data from DNP, 2019

6.2 | BUILDING TECHNICAL CAPACITY TO USE THE GUIDANCE

Five workshops were held as part of the capacity building strategy, one national and four regional, which were attended by 89 participants (44 women and 45 men) from public entities at all territorial levels and from the private sector, academia and civil society.

The national workshop and the regional workshop for territorial entities in Bogotá, Cundinamarca, Antioquia and Caldas were held virtually. They aimed to provide information on the scope, guidelines and content of the Guidance and identify the main challenges and opportunities for its potential implementation. In addition, the regional workshop took a look at the experiences of the territorial entities in CRA in the context of climate change, as input for territorial planning, taking into account that these are the territories that lead in DRM and CCA in Colombia. The table below summarises the main challenges and perspectives for the potential implementation of the Guidance identified in the course of these two workshops.

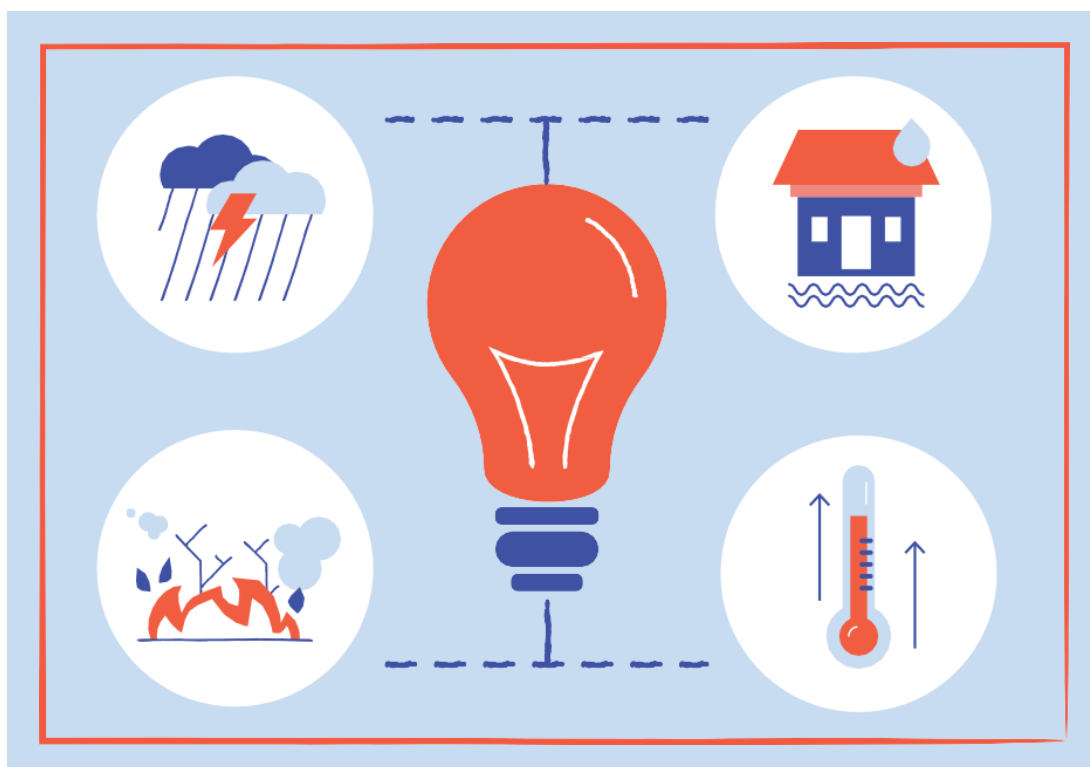


Table 7. Challenges and opportunities for the implementation of the Guidance identified at the virtual workshops

Source: Developed by the author

WORKSHOP	MAIN CHALLENGES IDENTIFIED FOR CRA	OPPORTUNITIES FOR THE POTENTIAL IMPLEMENTATION OF THE GUIDANCE IN LOCAL AND REGIONAL CONTEXTS
1 National	<ul style="list-style-type: none"> • The problems that department and municipal governments have to resolve in different sectors are so wide-ranging and critical that the risk knowledge and reduction processes required for DRM tend to get pushed from the public agenda. • The coordination of environmental and territorial planning instruments leads to methodological difficulties, since each instrument has a different focus which must be adjusted so that it can be applied in coordination with other instruments. • The public procurement system is not designed for NbSs. • The lack of accurate information on the cost-benefit ratio of measures leads to mistrust and lack of interest among decision-makers • Information on regions is outdated or decontextualised. • Capacity building and stronger social participation is required. • There are few sources of funding. • The low level of monitoring of the implementation of the measures defined in the instruments means that what has been planned is not always implemented. 	<ul style="list-style-type: none"> • Promotion of the implementation of DRM policy in its system version has generated significant capacities in most regions in territorial and environmental entities and in the private sector. • Using impact chains is a good option for the characterisation of risk scenarios in the context of climate change, especially through participatory processes. • The risk management plan updating process provides an opportunity for the inclusion of multi-hazard assessment. Multi-hazard assessment and impact chains can be included in risk identification, prioritisation and characterisation. • Multi-hazard approaches can be used to promote coordination between DRM and CCA. • The Eco-Disaster Risk Reduction (ECORRD) approach can be included. • Graduality and scalability criteria can be applied to take into account the diversity of regions in terms of DRM and CCA requirements. This means that what is required of territorial entities varies depending on their technical and financial capacities.

Table 7. Challenges and opportunities for the implementation of the Guidance identified at the virtual workshops

Source: Developed by the author

WORKSHOP	MAIN CHALLENGES IDENTIFIED FOR CRA	OPPORTUNITIES FOR THE POTENTIAL IMPLEMENTATION OF THE GUIDANCE IN LOCAL AND REGIONAL CONTEXTS
<ul style="list-style-type: none"> • 2 • Antioquia, Caldas, Cundinamarca, Bogotá 	<ul style="list-style-type: none"> • Need to increase the budget for investment in DRM and CCA, activities that cut across development. This can be achieved by including specific budget allocations for DRM and CCA in the General Transfer System, under which the government allocates funds for education, health, housing, etc. Need to work with the legislative branch to raise awareness: municipal councils, department assemblies and Congress, as it is they who approve budget allocations for the implementation of development plans. • Multiplicity of planning instruments that must be formulated by municipalities, in which planning for DRM is short-term • Absence of updated, relevant and scalable information and studies coordinated with planning, mainly in Category 5 and 6 municipalities • Lack of coordination between the academia and decision-makers • Absence of local knowledge applied in interlinked relationships • Low participation of social representatives in risk management committees 	<ul style="list-style-type: none"> • Take rural areas into account; risk assessment and management is currently focused on cities and urban areas. • Create multidisciplinary committees. • Train core teams through the regional climate change hubs or department governments. • Promote knowledge and experience sharing to develop capacities. • Review information from studies and experiences in other parts of the country. • Implement a pilot or several small pilots in municipalities with greater needs. • Provide funding through budget allocations to risk and climate change management.

At the regional workshop, the participants indicated whether they had addressed any of the issues included in the Guidance in their work. Those addressed the least and therefore requiring more action for implementation are:

Tolerable risk level to define risk categories

Inclusion of slow-onset climate hazards (e.g. droughts, desertification, sea-level rise)

Compound events: multiple events occurring simultaneously or successively

Population projections and other social variables

Urban growth projections



The regional workshops held in Cúcuta (Norte de Santander), Florencia (Caquetá) and Barranquilla (Atlántico) mainly focused on disseminating information on the scope, guidelines and contents of the Guidance, gathering the participants' views on the potential for implementation and carrying out practical exercises so that participants would have the opportunity to gain an in-depth understanding of concepts such as cascading impacts and multi-hazard assessment. The table below shows the challenges identified for the potential implementation of the Guidance at these workshops.

Table 8. Challenges identified at the in-person workshops

WORKSHOP	MAIN CHALLENGES IDENTIFIED			
Cúcuta	Establishing links to SDGs	Creating a climate change observatory in the department	Fostering research and incorporation of new technologies	Coordinating agricultural and climate change issues in risk management
Florencia	Implementing gender and differentiated approaches	Ensuring a comprehensive approach in technical and detail studies	Increasing the risk knowledge component	Coordinating environmental and sectoral planning and risk management
	Coordinating the national development plan with municipal development plans for the adoption of a risk management methodology	Providing training for politicians taking up public office on the different technical studies that need to be taken into account when formulating development plans	Insufficient financing mechanisms	
Barranquilla	Working across sectors and levels	Focusing resources on improving technology to enhance risk knowledge	Building buy-in for the Guidance from central government institutions	

7 |

LESSONS LEARNED



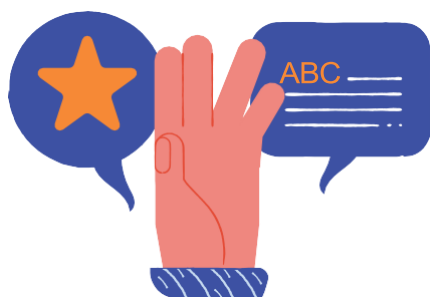
LEVEL OF DEVELOPMENT OF MUNICIPALITIES AS A CONDITIONING FACTOR FOR DRM

One of the documents reviewed for the feasibility analysis was the institutional assessment and results report on the National Policy for Disaster Risk Management (DNP and Economía Urbana, 2018). It evaluates different aspects of the organisation and functioning of the SNGRD, the roles of the entities in coordination and cooperation, resources, information and capacities for the implementation of the policy. It also describes progress in implementing the policy and the results obtained.

One finding that stands out from this report is that the DNP Comprehensive Performance Index² explains the level of institutional capacity for DRM and the level of implementation of the policy in the municipalities in a statistically significant manner. This is important because it shows that the municipalities with the highest level of development – reflected in better basic services for the population – the ability to meet development plan goals and effective tax and administrative management also develop stronger institutional capacities and achieve greater advances in DRM.

The efforts of central government institutions to promote investment in risk knowledge and reduction and CCA processes, in line with the content of the Guidance, would therefore be more effective if they were differentiated according to level of development. This would allow them to generate messages consistent with the proficiency of the teams responsible for these areas and to recommend the prioritisation of actions in line with institutional capacities.

In addition, it would be useful to include indicators measuring DRM and CCA results in the Comprehensive Performance Index to promote interest among local and department authorities, with a view to getting these issues on the agenda of mayors, governors, and heads of planning and interior departments, who play a key role in budget planning.

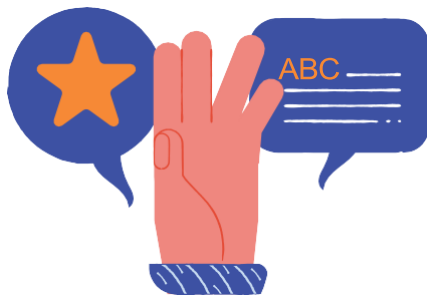


DIFFERENCES IN CHALLENGES AND PRIORITIES AMONG REGIONS

At the workshops held in three regions with different prevalent hazards and vulnerability conditions, the participants described different challenges for the potential implementation of the Guidance and, in general, for the improvement of DRM, according to the conditions in their area. In the Amazon foothills area, they mentioned a lack of resources for development, which affects the resources available for DRM and CCA purposes. Ensuring the continued availability of land transport routes connecting the area to the central part of the country is a key factor for the movement of people and goods and for basic services for the population. Therefore, DRM measures relating to transport infrastructure are a priority in this area. It was also highlighted that institutional DRM teams are not sufficiently involved in territorial planning and that it is necessary to increase risk knowledge and conduct detailed technical studies to inform plans, especially development plans.

The challenges indicated for cities in the Caribbean region, which have greater resources and a higher level of development, included the lack of prioritisation of these issues by municipal and department authorities in the allocation of resources, the shortage of professionals with expertise in environmental and earth sciences in the DRM and CCA teams and the continuation of detrimental practices by communities, which means that they maintain hazard conditions, sometimes in the hope of receiving aid during emergency response operations.

Lastly, in the Andean region and the Norte de Santander border area, the main challenges reported were the lack of modernisation and information systems for agricultural production, the absence of provisions in territorial planning to regulate the use of land on steep slopes susceptible to landslides and prevent the development of informal settlements, the failure to ensure compliance with technical standards for infrastructure, a lack of alternative means of transport and a low level of climate change awareness among communities.



NEED FOR METHODOLOGICAL RECOMMENDATIONS FOR THE ASSESSMENT OF FUTURE RISKS IN THE CONTEXT OF CLIMATE CHANGE

The review of the methodological guides for preparing planning instruments revealed a lack of methodological developments for risk assessment in the context of climate change. Some guides recommend using the results of the NC3 climate change scenarios. These include expected average values of multi-year changes in temperature and rainfall to 2040, 2070 and 2100. This is the first step in modelling the impacts, that is, the potential negative consequences of the changes in average values and the degree of variability of these variables on ecological and human systems, the results of which can be used for territorial planning and project formulation.

However, the NC3 also includes the calculation of 113 indicators at the municipal level measuring specific impacts, such as sea-level rise, coastline changes and changes in optimal land allocation for crops and ecosystems, which can be used to identify new climate change hazards, guide urban development, especially in coastal municipalities, and prioritise issues requiring additional analysis.

Regional risk assessments carried out in Colombia have informed the design of projects, such as those forming part of the country's portfolio for the Green Climate Fund and those designed and implemented by the Adaptation Fund with CCA criteria. The methodologies used, which have already been applied in the country, could be reviewed.

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GUIDELINES FOR THE POTENTIAL IMPLEMENTATION OF THE

Technical Guidance on Comprehensive Risk Assessment
and Planning in the Context of Climate Change
(developed by UNDRR and GIZ, with the support of Eurac Research)

IN PLANNING INSTRUMENTS IN COLOMBIA

RESULTS REPORT

